

**APPENDIX D**

**BIOLOGICAL ASSESSMENT**

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**Endangered Species Act**

**BIOLOGICAL ASSESSMENT**

**Proposed Transfer of Parcel G by the**

**U.S. Department of Energy**

**to the City of Oak Ridge, Tennessee**

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**BIOLOGICAL ASSESSMENT FOR  
THREATENED AND ENDANGERED SPECIES  
UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT  
FOR THE PROPOSED TRANSFER OF PARCEL G  
BY THE U.S. DEPARTMENT OF ENERGY  
TO THE CITY OF OAK RIDGE, TENNESSEE**

**SUMMARY**

This biological assessment (BA) assesses the potential for adverse effects on two federally listed animal species that could result from the transfer of Parcel G by the U.S. Department of Energy (DOE) to the city of Oak Ridge in the Scarboro Creek watershed on the Oak Ridge Reservation. The species discussed in this BA are those mentioned in a letter from the U.S. Fish and Wildlife Service (FWS) to DOE, dated December 19, 2001, regarding the preparation of an environmental assessment for the proposed transfer of the American Museum of Science and Energy, Parcel 279.01, and Parcel G to the city of Oak Ridge in Anderson County, Tennessee (FWS 2001). The FWS determined that the gray bat (*Myotis grisescens*) and the Indiana bat (*Myotis sodalis*) might occur on or near the Parcel G property. Both species are federally listed as endangered.

Based on the information presented in this BA, DOE concludes that the proposed transfer of Parcel G to the city of Oak Ridge is not likely to adversely affect either of the listed species. Neither species appears likely to be present on Parcel G, and proposed or designated critical habitats for the species are not present on or near the parcel. No caves or other suitable hibernacula or roosting habitat for gray bats are present at Parcel G. However, caves that could provide potential roosting habitat for the gray bat are present within 4 miles of Parcel G. Although the ultimate use of Parcel G by the city of Oak Ridge may eventually require removal of trees, potential summer roosting habitat at the site is at best marginal for Indiana bats. Also, there are adequate numbers of suitable and potentially suitable roost trees available immediately adjacent to Parcel G. Scarboro Creek within Parcel G is not considered to be good foraging habitat for gray or Indiana bats since it is a narrow, small stream with limited riparian habitat. In addition, the Clinch River, Melton Hill Lake, and lower Scarboro Creek, located adjacent to Parcel G, provide additional suitable foraging habitat for both species.

## **INTRODUCTION AND PROJECT DESCRIPTION**

The proposed action evaluated in the environmental assessment is the U.S. Department of Energy (DOE) conveyance of the American Museum of Science and Energy (AMSE), Parcel G, and Parcel 279.01 to the city of Oak Ridge, Tennessee (DOE 2002). The purpose of the proposed DOE action is to provide a plan for the long-term financial stability of the AMSE in order to preserve the museum as an asset to the city of Oak Ridge and the surrounding region. The purpose of the proposed action is also to transfer excess DOE-Oak Ridge Operations Office real property for economic development in order to help offset potential economic losses resulting from DOE downsizing, facility closeouts, and work force restructuring.

Since specific uses of Parcel G would not be known prior to the transfer, DOE has developed reasonably foreseeable scenarios and uses to bound the impacts analysis. Scenarios identify potential tenants; utilities and infrastructure; areas to be excluded from development; and a range of emissions, effluents, and wastes that could result from commercial and industrial activities. Parcel G may be developed for small-scale offices, light industrial use, or retail businesses.

## ECOLOGICAL DESCRIPTION OF THE SITE

Parcel G contains about 20.0 acres and is located southeast of the intersection of Bethel Valley and Scarboro roads (Fig. 1). A portion of Parcel G is within the area of the Oak Ridge Institute of Science and Energy Scarboro Operations Site (formerly the South Campus Facility). The Scarboro Operations Site supported research on the biological effects of radionuclides on animals. The portion of Parcel G that is within the boundary of the Scarboro Operations Site was an area where only unexposed animals were housed or grazed. In addition to pasture, the area contained various barns and a three-tiered swine waste treatment pond system. Only one barn structure remains within Parcel G. Nearby land uses include the Y-12 Plant buffer area, Bethel Valley Industrial Park, Commerce Park, and the University of Tennessee Forest Experiment Station and Arboretum. Parcel G is currently zoned by the city of Oak Ridge as F.A.I.R. (Forestry, Agriculture, Industry, and Research District).

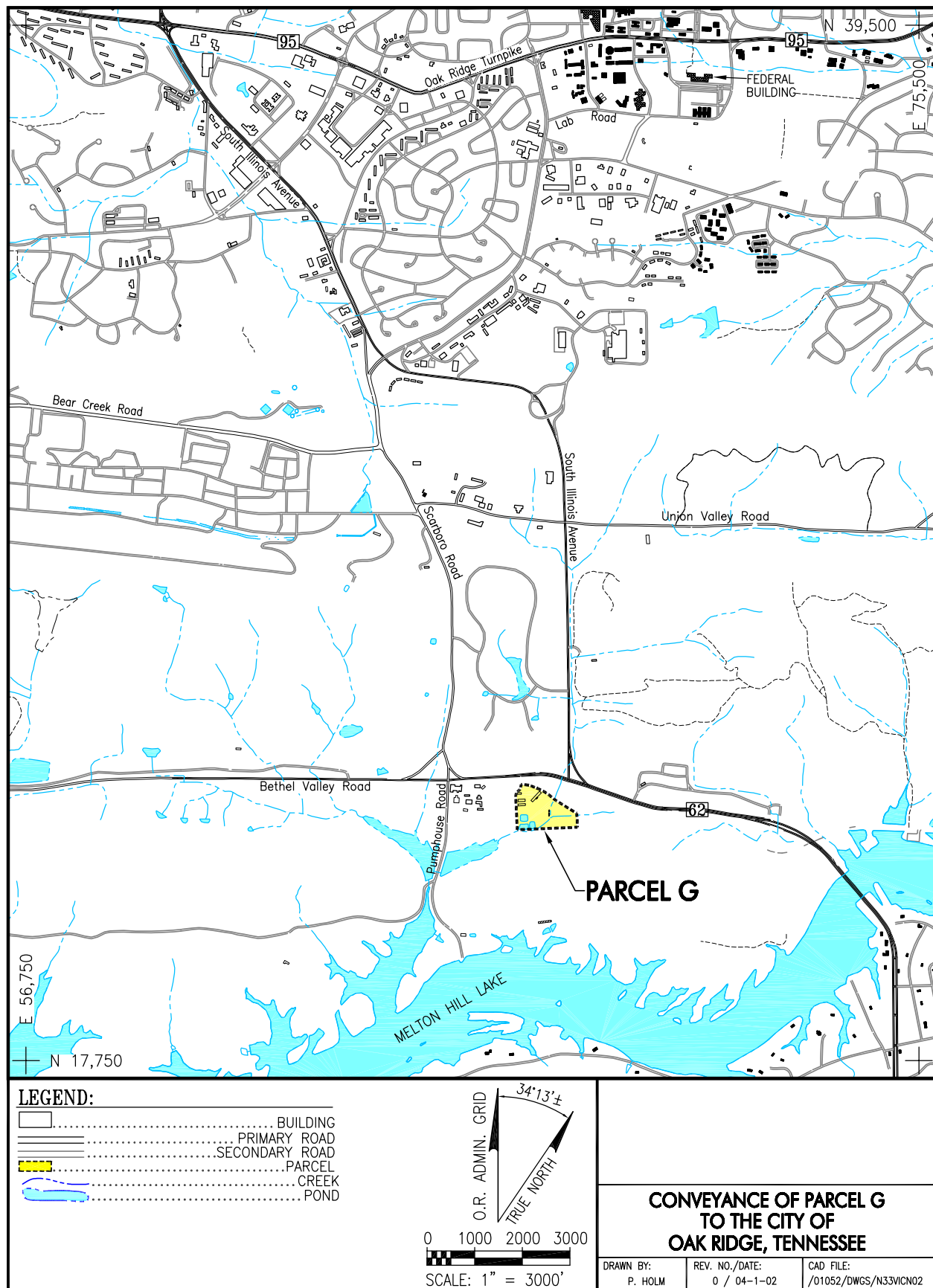
Vegetation on more than half of the 20-acre site is maintained in a mix of grasses and herbaceous plants. This part of Parcel G is periodically mowed and has been used in the past for hay production.

Large shrubs and scattered tree saplings dominate three smaller parts of the site. These areas include the buffer around and between the three former swine waste ponds, part of the Scarboro Creek floodplain, and part of the hillside along the south-central property line. Dominant shrub species are autumn-olive (*Elaeagnus umbellata*), multiflora rose (*Rosa multiflora*), and bush honeysuckle (*Lonicera tatarica* or *L. maackii*). Trees include sweetgum (*Liquidambar styraciflua*), green ash (*Fraxinus pennsylvanica*), and black willow (*Salix nigra*) saplings.

Upland woodland habitat is present on the small knoll in the southeastern corner of the site. This part of the site used to be cleared and had fenced holding pens for animals. The area now supports a young woodland composed primarily of boxelder (*Acer negundo*) with scattered black cherry (*Prunus serotina*) and sycamore (*Platanus occidentalis*). Trees in this area are relatively young with a maximum diameter of 5-6 in. at breast height (4.5 ft). There are areas of closed canopy and partially open canopy in the woodland area. The soil surface is firm, with minimal buildup of organic matter. There are no caves or large rock outcrops on the site.

Scarboro Creek flows from north to south across the center of the site. Scarboro Creek is a small, perennial stream. A small, ephemeral stream flows from the east into Scarboro Creek wooded uplands toward the access road. The stream channels of both creeks are well defined, with sand, silt, gravel, and cobbles. Scarboro Creek supports fish and other aquatic life. The floodplain of Scarboro Creek has a small wetland system associated with it, and it is described below.

A palustrine emergent/scrub-shrub wetland (PEM1/PSS1) exists at Parcel G in the floodplain along Scarboro Creek, which crosses the center of the site. The soil is temporarily flooded and saturated. The wetland includes a mix of persistent and nonpersistent emergent plants and woody plants. Dominant plants include black willow, fowl manna grass (*Glyceria striata*), cattails (*Typha* sp.), softstem bulrush (*Schoenoplectus validus*), soft rush (*Juncus effusus*), curly dock (*Rumex crispus*), horsetail (*Equisetum* sp.), spotted jewelweed (*Impatiens capensis*), hog peanut (*Amphicarpaea bracteata*), Joe-Pye-weed (*Eupatoriadelphus* sp.), and peppermint (*Mentha X piperita*). The soil consists of sandy loams, silt loams, and clay loams with low chroma matrix color, mottles with brighter chromas, and manganese concretions.



**Fig. 1. Vicinity map for Parcel G.**



## ECOLOGICAL DESCRIPTION AND POTENTIAL IMPACTS OF THE PROJECT ON LISTED SPECIES

The general ecology of the gray bat and Indiana bat and any potential adverse effects on the species from the proposed action are summarized below. Unless otherwise noted, general biological information on the species is derived from the published literature, reports, and Internet resources listed under each species heading.

### Gray Bat (*Myotis grisescens*)

Unless otherwise noted or referenced, the following general biological information on the gray bat is derived from FWS (1991), Harvey (1992), and Kentucky Bat Working Group (KBWG) (2000). The core range of the endangered gray bat encompasses the cave regions of Alabama, northern Arkansas, Kentucky, Missouri, and Tennessee, but a few occur in northwestern Florida, western Georgia, southwestern Kansas, south Indiana, south and southwestern Illinois, northeastern Oklahoma, northeastern Mississippi, western Virginia, and possibly western North Carolina. Gray bats are restricted to caves or cave-like habitats, and few caves meet their specific roost requirements. These restrictions result in about 95% of the population's hibernating in only eight or nine caves. For hibernation, the roost site must have an average temperature of 5.6°C to 11.1°C (42°F to 52°F). Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm, between 13.9°C to 25.0°C (57°F and 77°F), or have small rooms or domes that can trap the body heat of roosting bats. Summer caves are normally located close to rivers or lakes where the bats feed. Gray bats have been known to fly as far as 12 miles or more from their colony to feed.

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will use transient or stopover caves along the way. One-way migrating distance between winter and summer caves may vary from as little as 16.09 km (10 miles) to well over 321.8 km (200 miles). Mating occurs as bats return to winter caves in September and October. By November, most gray bats are hibernating. Adult females begin to emerge in late March, followed by juveniles and adult males. Females store sperm over the winter and become pregnant the following spring. A few hundred to many thousands of pregnant females congregate to form maternity colonies. Males and nonreproductive females gather in smaller groups to form what are known as bachelor colonies. A single pup is born in late May or early June. The young begin to fly 20 to 25 days after birth. Gray bats primarily feed on flying insects over lakes, rivers, and streams. Aquatic insects, particularly mayflies, make up most of their diet.

Information about the occurrence of gray bats on the Oak Ridge Reservation (ORR) is limited. In November 1994, a single, dead gray bat was found in a display cabinet in Building 9204-3 at the Oak Ridge Y-12 Plant. The bat was probably an isolated individual juvenile that became lost, disoriented, and trapped. Mist netting for bats was conducted on the lower East Fork Poplar Creek (EFPC) and its tributaries in May 1992 and again in May through June 1997 (Harvey 1997). The 1997 survey included portions of lower Bear Creek near its confluence with lower EFPC. The creeks in this area provided good gray bat foraging habitat at the time of the surveys. No gray bats were recorded among the six species captured. More than 20 caves have been identified on the ORR. Mitchell et al. (1996) surveyed seven of the caves (Copper Ridge, Flashlight Heaven, Walker Branch, Big Turtle, Little Turtle, Pinnacle, and Bull Bluff), but no gray bats were found. There is an unverified report of ten gray bats roosting in Little Turtle Cave in September 1996. These bats were observed roosting and were not further disturbed; therefore, a definite, in-the-hand identification was not made (Webb 1996). Examination of photographs taken of the roosting bats indicate that they appeared to be *Myotis* and more than likely were gray bats, but the species could not be positively determined [Major (2000) and Henry (2000)].

Although no caves are present within the area of the proposed project, several caves are located within 6.4 km (4 miles) of the proposed site location and two of the caves are located within 2.4 km (1.5 miles). None of the caves has been completely and systematically surveyed for bats, except for the limited surveys

reported in Mitchell et al. (1996) and the 1996 report of *Myotis* roosting in Little Turtle Cave. The caves within the vicinity of the project area may not provide adequate hibernacula for gray bats, but they could provide transient or stopover roosting habitat for migrating gray bats. Suitable foraging habitat for gray bats within the vicinity of the proposed facility includes the Clinch River and the Scarboro Creek embayment. Scarboro Creek is a narrow, small stream and is considered suboptimal for frequent foraging for gray bats.

Since no caves are present within Parcel G, none would be disturbed as a result of any construction activities that might result from the transfer of Parcel G. Construction activities would also not directly impact any potential foraging habitat that exists in the vicinity, and all construction activities would only occur during the day, so any nearby foraging by gray bats would also not be disrupted. Activities associated with the operation of any new facilities would also primarily occur during the day and would not be expected to disrupt any gray bats that might forage near the site. In addition, the light industrial or commercial operations that are likely to be developed would not produce significant emissions or effluents that could directly impact foraging gray bats or indirectly affect aquatic insect fauna on which the gray bats would prey. Thus, the proposed transfer is unlikely to adversely affect the gray bat or its habitat.

### **Indiana bat (*Myotis sodalis*)**

Unless otherwise noted or referenced, the following general biological information on the Indiana bat is derived from FWS (1991, 1999a, 1999b, 2000), Harvey (1992), and KBWG (1997, 2000). The Indiana bat is a migratory species found throughout much of the eastern half of the United States from Oklahoma, Iowa, and Wisconsin east to Vermont and south to northwestern Florida. For hibernation, Indiana bats prefer limestone caves with stable temperatures of 3.3°C to 6.1°C (38°F to 43°F) and high relative humidity. As with the gray bat, few caves meet the specific roost requirements of the species. Subsequently, more than 85% of the population hibernates in only nine sites. However, Indiana bats have been found hibernating in a few abandoned mines, a tunnel, and a hydroelectric dam. The bats hibernate from October to April, depending on climatic conditions. Density in tightly packed clusters is usually estimated at 3228 bats per m<sup>2</sup> (300 bats per ft<sup>2</sup>), although as many as 5165 bats per M<sup>2</sup> (480 per ft<sup>2</sup>) have been reported.

Female Indiana bats depart hibernation caves before males and arrive at summer maternity roosts in mid-May. A single offspring is born between late June and early July. The young bats can fly within a month of birth. Early researchers considered floodplain and riparian forest to be the primary roosting and foraging habitats used during the summer by the Indiana bat, and these forest types unquestionably are important. More recently, upland forest has been shown to be used by Indiana bats for roosting. Within the range of the species, the existence of Indiana bats in a particular area may be governed by the availability of natural roost structures, primarily standing dead trees with loose bark. The suitability of any tree as a roost site is determined by (1) its condition (dead or alive), (2) the quantity of loose bark, (3) the tree's solar exposure and location in relation to other trees, and (4) the tree's spatial relationship to water sources and foraging areas. The most important characteristic of roost trees is probably not species but structure (i.e., exfoliating bark with space for bats to roost between the bark and the bole of the tree). To a limited extent, tree cavities and crevices are also used for roosting. Maternity colonies use multiple primary roost trees, which are used by a majority of the bats most of the summer, and a number of "secondary" roosts, which are used intermittently and by fewer bats, especially during periods of precipitation or extreme temperatures. The summer roost of adult males is often near maternity roosts, but where most spend the day is unknown. Others remain near the hibernaculum, and a few males are found in other caves during summer. Researchers have found that primary roosts are generally in openings or at the edge of forest stands, while alternate roosts can be either in the open or in the interior of the forest stands. Indiana bats use roosts in the spring and fall similar to those selected during the summer. During the fall, when Indiana bats swarm and mate at their hibernacula, male bats roost in trees nearby during the day and fly to the cave during the night.

Indiana bats forage in and around the tree canopy of floodplain, riparian, and upland forest. In riparian areas, Indiana bats primarily forage around and near riparian and floodplain trees (e.g., sycamore,

cottonwood, black walnut, black willow, and oaks), and solitary trees and forest edge on the floodplain. Streams, associated floodplain forests, and impounded bodies of water (e.g., ponds, wetlands, and reservoirs) are preferred foraging habitat for pregnant and lactating Indiana bats, some of which may fly up to 1.5 miles from upland roosts. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (e.g., old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures. Indiana bats return nightly to their foraging areas. Indiana bats feed strictly on flying insects, and their selection of prey items reflects the environment in which they forage. Both aquatic and terrestrial insects are consumed. Moths, caddisflies, flies, mosquitoes, and midges are major prey items. Other prey includes bees, wasps, flying ants, beetles, leafhoppers, and treehoppers. During September, the bats depart for hibernation caves.

Information about the occurrence of Indiana bats on the ORR is limited. Mist netting for bats was conducted on lower EFPC and its tributaries in May 1992 and again in May through June 1997 (Harvey 1997). The 1997 survey included portions of lower Bear Creek near its confluence with lower EFPC. The creeks in this area provided Indiana bat summer roosting and foraging habitat at the time of the surveys. No Indiana bats were recorded among the six species captured.

In Tennessee, the nearest hibernating population of Indiana bats exists in White Oak Blowhole Cave, located in Blount County in the western end of the Great Smoky Mountains National Park. This cave has been designated as critical habitat for this species. A few Indiana bats also hibernate in Bull Cave, also located in Blount County. No maternity roosts have been located on the ORR, or as yet in Tennessee. However, in July 1999, a small colony of Indiana bats was discovered roosting in a dead hemlock tree on the Cheoah Ranger District of the Nantahala National Forest in Graham County, North Carolina. This discovery represents the first record of a reproductive female Indiana bat being found south of Kentucky. Recent collections of individual Indiana bats have also been recorded from the Cherokee National Forest near Tellico Lake in Monroe County, Tennessee. These reports indicate that summer colonies of the species may be present in east Tennessee. The habitat from which these individuals were collected is similar to suitable habitat found on the ORR.

Although there is no suitable summer roosting habitat for the Indiana bat on Parcel G, there is probably suitable habitat along Haw Ridge, which borders Parcel G to the south. Although unlikely, a maternity colony, an adult male colony, or individual Indiana bats could use roosting habitat located in the vicinity of the Parcel G. Suitable foraging habitat for Indiana bats within the vicinity of Parcel G includes the Clinch River and the Scarboro Creek embayment. Upper Scarboro Creek is a narrow, small stream and is considered suboptimal for frequent foraging for Indiana bats.

Any construction activities on Parcel G would likely require removal of trees at the site. Clearing of the woodland at Parcel G should not adversely affect Indiana bats since the existing habitat is considered to be of poor quality. Even with the poor quality of the habitat, it would be recommended that no tree cutting would occur during the summer roosting season from May through September. This should prevent the loss of any bats that otherwise might be using the trees for rearing young and should also eliminate the need for mist netting or detailed surveys. Construction activities would also not directly impact any potential foraging habitat that exists in the vicinity of Parcel G and all construction activities would only occur during the day, so any nearby foraging by Indiana bats would also not be disrupted. Activities associated with the operation of any new facilities would also primarily occur during the day and would not be expected to disrupt any Indiana bats that might forage near the site. In addition, the light industrial or commercial operations that are likely to be developed would not produce significant emissions or effluents that could directly impact foraging Indiana bats or indirectly affect aquatic insect fauna on which the Indiana bats would prey. Thus, the proposed transfer is unlikely to adversely affect the Indiana bat or its habitat.

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